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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/061,023	01/30/2002	Shyh-Ming Chang	ERSO83-002B	8525
28112	7590	03/11/2004	EXAMINER	
GEORGE O. SAILE & ASSOCIATES 28 DAVIS AVENUE POUGHKEEPSIE, NY 12603			NGUYEN, DILINH P	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/061,023

Applicant(s)

CHANG ET AL.

Examiner

DiLinh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Bibdatasheet

This application is a DIV of 08/239,575, 05/09/1994, PAT 5427382 not consistent with PTO records.

Correction is required. See MPEP § 608.01(b).

Specification

The specification of the disclosure is objected to because: in lines 1-3 of RELATED PATENT APPLICATIONS, the serial No. 08/239,424, filed May 6, 1994, now U.S. Pat. 5393679 is not consistent with PTO records.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang et al. (U.S. Pat. 5578527).

Chang et al. disclose a semiconductor device (fig. 2, column 3, lines 20 et seq.) comprising:

an integrated circuit element 30 having input/output pads 32;

a substrate 10 having input/output pads 12; and

a plurality of physical and electrical connection between the element input/output pads and the substrate input/output pads wherein each the connection includes a composite bump comprised of a polymer body 43 and a conductive metal coating 41 covering the polymer body, the polymer body has a Young's Modulus of between about 400,000 and 500,000 pounds per square inch (column 3, lines 55-60), and wherein the composite bump is inherently deformed when the connection is made.

- Regarding claim 2, Chang et al. disclose the polymer is polyamic acid polyimide.
- Regarding claim 3, Chang et al. disclose the conductive metal coating comprises chrome, copper, and gold.
- Regarding claim 4, Chang et al. disclose the composite bumps are formed on the IC element input/output pads prior to formation of the connection (figs. 2, 4-5 and 7-8).
- Regarding claim 5, Chang et al. disclose the composite bumps are formed on the substrate input/output pads prior to formation of the connection (figs. 3-4 and 6-7).
- Regarding claim 6, Chang et al. disclose the composite bumps are formed on both the IC element input/output pads and substrate input/output pads prior to formation of the connection (figs. 4 and 7).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karnezos (U.S. Pat. 4813129) in view of Afzali-Ardakani et al. (U.S. Pat. 5397863).

- Regarding claims 1-2, Karnezos discloses a semiconductor device (figs. 2-3, column 4, lines 15 et seq.) comprising:

an element 26 having input/output pads 28;

a substrate 12 having input/output pads 14; and

a plurality of physical and electrical connection between the element input/output pads and the substrate input/output pads wherein each the connection includes a composite bump comprised of a polymer body 18 (column 4, lines 37-38) and a conductive metal coating 20 covering the polymer body, and wherein the composite bump is inherently deformed when the connection is made.

Karnezos fails to disclose the polymer body has a Young's Modulus of between about 400,000 and 500,000 pounds per square inch.

Afzali-Ardakani et al. disclose a polymer is polyamic acid polyimide (column 8, lines 12-14); therefore, the polymer body has a Young's Modulus of between about 400,000 and 500,000 psi. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Karnezos to improve dielectric composition, suitable for use in high performance electronic device packaging and to methods for fabricating the improved dielectric, as shown by Afzali-Ardakani et al.

- Regarding claim 3, Karnezos discloses the conductive metal coating comprises Cr/Cu/Au (column 3, lines 15-18).
- Regarding claim 4, it would have been obvious to form the composite bumps on the IC element input/output pads prior to formation of the connection.
- Regarding claim 5, Karnezos discloses the composite bumps are formed on the substrate 12 input/output pads prior to formation of the connection (fig. 2).

3. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karnezos (U.S. Pat. 4813129) in view of Afzali-Ardakani et al. (U.S. Pat. 5397863) and further in view of Schulte et al. (U.S. Pat. 4865245).

Karnezos and Afzali-Ardakani et al. fail to disclose the composite bumps are formed on both the integrated circuit element input/output pads and substrate input/output pads prior to formation of the connection.

Schulte et al. disclose a semiconductor device (figs. 4-5) comprising :

composite bumps are formed on the integrated circuit element 10 (column 2, lines 59-60) prior to formation of the connection and the composite bumps are formed on both the integrated circuit element 10 and substrate 16 prior to formation of the connection (fig. 4-5). Therefore, it would have been obvious to modify the device of Karnezos and Afzali-Ardakani et al. to increase production yield and improve performance characteristics of the semiconductor packaging, as shown by Schulte et al.

Response to Arguments

Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

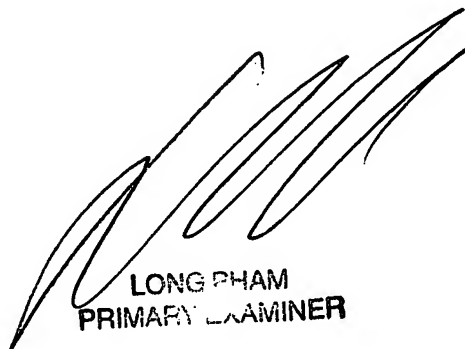
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN

March 5, 2004



LONG PHAM
PRIMARY EXAMINER